



Computed Microtomography of Bone Specimens for Rapid Analysis of Bone Changes Associated With Malignancy

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Mots-clés	3D analysis [8], bone metastasis [9], computed microtomography [10], Myeloma [11], osteolysis [12], Osteosclerosis [13]
Résumé en anglais	<p>Breast and prostate cancers are specially metastasizing to bone. Metastases from breast cancer usually exhibit a mixed osteolytic/osteosclerotic aspect, with osteolysis predominating. Osteosclerosis is a common finding in prostatic cancer although osteolysis occurs within the sclerotic lesions. B-cell malignancies (lymphoma, myeloma) are also associated with marked osteolysis. Histopathological examination of bone biopsies was used for the diagnosis of malignancies and, prior to embedding, microcomputed tomography (microCT) was done on the bone specimens. Patients (247) who presented either a bone metastasis, an overt myeloma, a lymphoma or a monoclonal gammopathy of undetermined significance were studied. All patients had a bone biopsy studied by 2D histomorphometry for the histopathology. During the fixation time, the bone cores were analyzed by microCT. On the 3D reconstructed models provided by microCT, signs of osteolysis/osteosclerosis were searched: excess of bone resorption, focal disorganization of microarchitecture, bone metaplasia, osteosclerosis. A strong agreement was obtained between histomorphometry and microCT results using Cohen's kappa test ($\kappa = 0.713$). MicroCT identified excess bone resorption on trabecular surfaces when eroded surfaces were $>10.5\%$ by histomorphometry. MicroCT failed to identify some patients with smoldering myeloma or some lymphomas with microresorption. MicroCT data are obtained within 4 hr and suggest the malignant invasion of bone marrow when excess of bone resorption/formation is obtained. MicroCT can be used in the immediate postbiopsy period making possible a fast identification of malignancy. However these signs are not specific and must be confirmed by histopathological analysis.</p>

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